

CASE HISTORY 5

ROBERT LOUIS STEVENSON MIDDLE SCHOOL: GENERAL MATH

Matthew Baylor

Charles Souza

Robert Louis Stevenson Middle School

Honolulu, Oahu, Hawaii

Here is the story of our youngest multiplayer classroom: a seventh grade math class. The game is *Knowledge Quest*, set in medieval times. A good deal of thought went into mapping game terminology to common classroom objects and tasks. The quest for an experience bar is heroic. I love the negative XP for not closing laptops. And there was an additional factor to be considered. This was an eclectic group of students to say the least.

As we saw with the Marked Tree High School case history, the game must reach a variety of ages and demographics. Here we have a class composed of several demographics of varying abilities and needs. A primary challenge was to design a game for a class that included a mix of students, including special education students and English language learners.

So let's journey into the past on the island of Oahu, and the class that with the help of their instructors (shown in Figure CH5.1) turned it into a Treasure Island indeed.

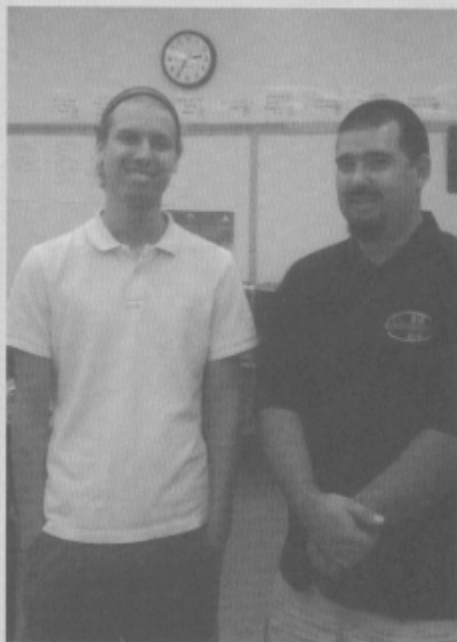


Figure CH5.1

Matthew Baylor and Charles Souza.

ABOUT THE CLASSROOM

Our classroom is a seventh grade (inclusion) General Math class at a public middle school in the Honolulu District of Oahu. The inclusion aspect of our class is that we have anywhere between three to five special education students who are in each class, without an aide. Because of this, there are two teachers in the classroom. Along with the special education students, we also have ELL (English language learners), ranging from barely any English to very good English.

HOW *KNOWLEDGE QUEST* WAS INTRODUCED

Robert Louis Stevenson Middle School utilizes different technologies in the classrooms, such as Promethean Boards and Google Docs. In our classroom, each student has a laptop, a TI-73 (Navigator) Explorer Calculator, and each student at the school has his or her own Google account. On the first day of the third quarter, we introduced the class no longer as a normal class but as a multiplayer game set in medieval times called *Knowledge Quest*. Using Google

Sites, we created a basic Web presence to explain the rules and also for the students to visit and keep track of their progress at www.rlsms.com/kq.

It started as a way to get the information of how the game worked on the first day, and it evolved daily. Google documents, spreadsheets, forms, gadgets, and presentations were all being used and were easily uploaded to a Google site. Experience points and gold were all inputted into one spreadsheet. From the spreadsheet, we now had charts linked to total XP for each kingdom, as well as each individual avatar. Each student had his or her own page with an automatically updating status bar linked to the XP page. Achievement badges were also placed on the students' pages.

The basic rules were as follows:

- Class time would be divided between fighting monsters (Homework, Worksheets, etc.), completing quests (Presentations, Case Studies, etc.) and crafting (Maintenance of Online Math Document, Use of Navigator System, White Board Work, etc.).
- At the beginning of the semester everyone in the class would choose and name their avatars.
- Guilds (groups) would be chosen and balanced as closely as possible by skill level and interests.
- Guilds would choose their names and design their shields.
- There would be six to seven guilds of three to four members each, depending upon class size.
- Students would begin on the first day of class as a Level 1 avatar. Level 10 would be the highest level they could achieve.

The first activity we introduced was to fill out an index card with their avatar's information: avatar name, kingdom shape (each period decided on a shape, circle, diamond, infinity, and star were chosen), seat number, strongest math subject, and to draw their avatar on the back. Second, we had each group of four build a Guild Crest. Each guild had four students, based on skill levels, chosen by the teachers. Each team had a high, a high-medium, a medium-low, and a low, or inclusion student, and we attempted to match personality types and students who would work best together. We did this so that each group was balanced, the

lower range students had an opportunity to learn from their peers, and each group had an equal chance of winning any sort of competitions we might play during the course of the day. The Guild Crests were shields, printed on paper with four equal segments and a section for a guild name. The students were to come up with a guild name, design a logo, and color it. Once completed, we hung them up in the classroom.

The first thing to note was that the XP the students were receiving was not directly related to their grade in the class. The students still received a grade (0–4 scale) on homework (10% of their grade) and quizzes/tests (90% of their grade).

How to gain experience and level up was explained, and it was also posted on our website. Each day we had the students log into their Google accounts, open their Math Notes document in their Google Docs, and type in the Learning Goal for the day. We also had them log into their Navigators. This was worth 50 XP if every member of the guild had this completed.

Before introducing *Knowledge Quest*, some students would come in, talk with their friends, not take out any materials to work with, the bell would ring, they would still be talking and not inputting their learning goals, and some would never write down the learning goal. As soon as we introduced *Knowledge Quest* and were giving students XP for completing these tasks, over 90% of the students were in class, seated, logging into their Navigators, and filling out their Math Notes with the learning goal for the day before class even started. Many students were now putting their learning goals into their notes before school or during recess. To encourage working as a guild, the 50 XP would only be given to the guild if every member had completed the task. As a result, students paid more attention to what their guild members were doing and reminded them to finish their work before doing anything else.

Students who received a 4 on a quiz would receive 300 XP (150 if done on a retake). A 3 on a quiz would be given 200 XP (100 if done on a retake). A 2 would be 100 XP (50 on a retake). On the more difficult CFA tests (monthly assessments), a 4 would be given 500 XP (250 on retake), a 3 would be given 400 XP (200 on retake), a 2 would be given 300 XP (150 on retake).

XP was also given for progress reports. If your grade in the class was an A, you would be given 300 XP, a B would be given 200 XP, and a C would be given

100 XP. Progress reports were given out every third, fifth, and seventh week of the quarter. This was done in an effort to get students to keep up with their grades throughout the quarter and not try to complete everything at the end of the quarter.

Homework, completed and turned in on time, was worth 100 XP. We saw an increase in homework being turned in, especially from a few of the inclusion and low students. This helped their grades, but overall, they showed more interest in leveling up than what their grades were. We could count on one hand how many times students asked: "Will this help my grade?" We had shown this to be true via our Marketplace, where students could buy "items" with the gold they earned.

With each level, students were given a certain amount of gold, which, in turn, they could spend on a number of different items in the Marketplace. Students could purchase things such as bottled water, chips, 20 minutes of game time on the PlayStation in class, 500 XP, pencils, dry erase markers, bonus points on their CFA, or quiz scores (which improved their grade for the class) and also a free homework pass. So far, 64% have purchased the 500 XP, 14% have purchased a homework pass, 14% have purchased game time, and 8% have bought chips. That is 0% bought the items that would improve their grades. This told us that the students were more interested in leveling up than they were in receiving a specific letter grade for the class.

A few extra features we added since the start included:

- **Badges**, which were little images that were added to the students' account pages when they performed a certain task well, such as asking great questions, or when the entire guild logged into their Navigators and Math Notes on time for a week straight. These seemed to be good incentives, but they were also very demanding on time, as it involved updating dozens of students Web pages more frequently.
- **Bonus Quests**, which were posted almost on a daily basis and were a great source for students to earn an extra 100 XP and either review material or current benchmarks. These were posted on the website, and were submitted via Google Forms.
- **Scheduled Tutoring**, where students came in specific days during recess and received extra help, either with the tests coming up or on work they

needed to redo. This was worth 100 XP. We had tutoring before *Knowledge Quest* and had seen an increase from zero students to almost six to seven students every time it was offered. From what we observed, it was stemming mostly from students who were very close to each other in total XP and were trying to keep up with each other. The students who really needed the help came in less frequently, but still more often than previously.

- **Negative XP** for not closing laptops as they left. We introduced this due to laptops being knocked over by bags and damaged while students were leaving class. This was a major issue getting students to remember to close their laptops before leaving class, but as soon as we introduced -50 XP for everyone in the guild if anyone in the guild left it open, the number of laptops left open dropped to zero. With no reminders or any sort of incentives, students continued to close their laptops, or if their guild member forgot, another member would close it for them. On some occasions, other guild members had been closing others for them. This drastic change was one of the most surprising outcomes and sustained itself with no reminders from the teachers.

Some of the observations we made during the time we began using *Knowledge Quest* in the classroom:

- Students were coming into class on time and were working together to complete their daily task of logging in. After they were finished, the students went onto the KQ website to see what their XP was and what badges they had earned.
- Our original thoughts were that picking avatar names was not going to be that important, but it really set the tone for the entire project. Students also created names for their guilds, which seemed to give them a sense of unity. All guilds created a shield, which also added to their togetherness.
- When going over what an equation was, we used a lot of gaming vocabulary. We did a weapons check, pencils were swords, dry erase markers were wands, red pens were torches, whiteboards and erasers were shields. The students, particularly the boys, responded really well to this. I did see a small divergence in boy to girl participation, but the

participation by these girl students was even lower before KQ. However, the student with the highest XP was a girl.

- As pencils and dry erase markers were a necessity in the classroom, before *Knowledge Quest* students were just given them when they didn't have them. Now, students were automatically charged 50/150 gold if they did not have a pencil or dry erase marker, respectively. This led to a large increase in the number of students bringing their materials to class. Badges were also awarded to those who consistently brought all their weapons to class.
- One student in particular who had not had much success in class before *Knowledge Quest*, was now fully engaged, turning in all homework assignments, and working really well with guild members. On multiple occasions, this student mentioned that math is now their favorite subject, and it is because of *Knowledge Quest*. Their grade is still low, but they have a better attitude and have made substantial progress in class.
- After introducing *Knowledge Quest*, 30% of students who had a grade letter of C or below for the first two quarters, had increased their grades to a B or higher.
- There are a total of 107 students, split between four periods. As of March 2011, 5% were level 1 (of which four students were new to class), 28% were level 2, 32% were level 3, 20.5% were level 4, 7.4% were level 5, and .9% (one student) was level 6.
- There has been some switching of guild members due to an imbalance in skill level, personality clashes, students leaving the school, and so on. But, for the most part, the guilds in which students were originally placed have worked well.
- When students have to work in their guilds during class time, a timer is started, and we say, "Enter battle formation!" This is the signal for students to work in their guilds.
- In order to set the tone in the classroom, medieval music often is playing or is played once our timer goes off. Students seem to enjoy the music and get into the game more when music is played along with the lesson.

As a whole, the structure of the curriculum has not changed, but rather what has changed is the vocabulary and context. With a little imagination and energy, changing a classroom into an RPG of any setting or time frame is as easy as renaming pencils to swords, math problems into monsters, squares into plots of land, and perimeters into fences around your land. This has been a very effective method to engage our students and to teach them in a manner that they will both enjoy and remember.

WHY WE WANTED TO TURN OUR CLASSROOM INTO AN RPG

Turning our classroom into an RPG started after a discussion on what the motivations of our seventh grade students were. Having seen students time and time again playing simple flash games, hearing conversations about what new games were coming out, seeing students play card games on campus, and even creating their own games with “Silly Bands,” it seemed obvious what the driving force behind our students’ interests were. But what was it that kept them coming back? After doing some research and watching a few TEDtalks, one which mentioned Lee Sheldon’s class, and others that mentioned the power of gaming to engage and promote learning, we decided to come up with a game model that would work for our classroom.

Being mild gamers ourselves and having some basic information on the psychology of gaming and other game theories, the one aspect of our game that we knew we needed to have was the experience bar. The experience bar, which fills until leveling up and then reverts back to empty, fulfills our motivating factor for a number of reasons. The tasks that fill the bar would be attainable and, therefore, would not discourage some students. The bar would be constantly growing, encouraging the students to continue their work in order to level up. Once the bar was filled, they had the achievement of leveling up, but now were left with an empty XP bar, which they once again wanted to fill up. We have experienced this ourselves with games, such as *We Rule* and *World of Warcraft*.

Our efforts to find an experience bar that was easily programmable came up empty. However, with the help of our school administrators, we figured out a relatively simple method of creating an experience bar, using Google sites and gadgets.